

**METHODS AND KITS FOR VOLUMETRIC DISTRIBUTION OF  
PHARMACEUTICAL AGENTS VIA THE VASCULAR ADVENTITIA  
AND MICROCIRCULATION**

**ABSTRACT OF THE DISCLOSURE**

Methods and kits for delivering pharmaceutical agents to the adventitia and other regions outside the external elastic lamina (EEL) surrounding a blood vessel utilize a catheter having a needle. The needle is positioned in up to 5 mm beyond the EEL and delivers an amount of pharmaceutical agent sufficient to circumferentially permeate around the blood vessel and, in many cases, extend longitudinally and radially along the blood vessel. Confirmation that a delivery aperture of the needle lies beyond the EEL may be required before delivering the pharmaceutical agent.

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